Department of Pesticide Regulation
Environmental Monitoring Branch
1001 I Street
Sacramento, CA 95814

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STUDY 247: Pilot Monitoring of Pesticide Residues in Urban Creeks of Sacramento County

I. INTRODUCTION

Pesticide monitoring in urban creeks are limited but for the creeks monitored pesticide residues are increasingly being detected in surface waters (Weston et al. 2006; Gan personal communication; DPR Surface Water Database). Detections of organophosphorous insecticides (OP), pyrethroids, and recently fipronil are shown to be toxic to aquatic macroinverterbrates in these urban creeks. In this study we will initiate effort in understanding and preliminary assessing the extent of contaminations and sources of pesticides found in urban creeks using Sacramento County as a model.

II. OBJECTIVE

The primary objective is to conduct a pilot monitoring survey of selected urban creeks in Sacramento County for pesticide residues including organophosphorous insecticides, carbamates, pyrethroids, fipronil, s-triazines and substituted urea herbicides.

III. PERSONNEL

The study will be conducted by staff from DPR's Environmental Monitoring Branch, Surface Water Protection Program under the general direction of Kean S. Goh, Agricultural Program Supervisor IV. Key personnel are listed below:

Project Leader:	Kevin Kelley
Field Coordinator:	Alveena Prasad
Senior Scientist:	Frank Spurlock
Laboratory Liaison:	Carissa Ganapathy
Chemists:	California Dept. of Food & Agriculture

Questions concerning this monitoring study should be directed to Kevin Kelley, Environmental Research Scientist, at (916) 324-4187.

IV. STUDY PLAN

The pilot study will survey urban creeks during Spring 2007 when pesticide use is anticipated to be high. Four sampling sites will be selected based on accessibility, sampling history, and their importance as habitats for aquatic organisms. These sites may include Arcade Creek, Chicken Ranch Slough, Morrison Creek, Dry Creek, Willow Creek etc. Surface water and sediment samples will be collected at four sites once a week for nine weeks. Surface water samples will be analyzed for OPs, carbamates, s-triazines, and fipronil and bed sediment samples for pyrethroids.

V. SAMPLING METHOD

Surface water samples will be collected using grab pole and bed sediment with trowel (Mamola, 2005). Water quality parameters including pH, electro-conductivity, dissolved oxygen will also be taken. Samples will be transported and stored on wet ice or refrigerated at 4^{o}C until extraction for chemical analysis. Transporting of samples will follow DPR SOP #QAQC004.01 (Jones, 1999). A chain-of-custody record will be completed and accompany each sample.

VI. CHEMICAL ANALYSIS AND QUALITY CONTROL

The California Department of Food and Agriculture Laboratory will conduct chemical analysis of all water and sediment samples. Quality control (QC) will be conducted in accordance with SOP QAQC001.00 (Segawa, 1995) and will include general continuing QC.

VII. DATA ANALYSIS

Pesticide concentrations in water will be reported in micrograms per liter (µg/L). Pesticide concentrations in sediment will be reported in micrograms per gram (µg/g).

VIII. TIMETABLE

Field Sampling:	April through June 30, 2007
Chemical analysis:	April through June 30, 2007
Preliminary Memorandum:	Nov 30, 2007
Final Report:	Jan 31, 2007

IX. BUDGET

Chemistry Analysis	**Cost/sample x # of samples** Weekly for 9 weeks (4+1QC)	Total
OPs	$650 x 45	$29,250
Carbamates	$800 x 45	$36,000
Fipronil	$650 x 30	$19,500
Triazine (short)	$450 x 45	$20,250
Pyrethroid sediment	$800 x 45	$36,000
TOTAL		**$141,000**

X. REFERENCES

DPR Surface Water Database http://www.cdpr.ca.gov/docs/sw/surfdata.htm

Jones, D. 1999. SOP #QAQC004.01 - Transporting, packaging and shipping samples from the field to the warehouse or laboratory. Available on-line: http://www.cdpr.ca.gov/docs/empm/pubs/sops/qaqc0401.pdf

Mamola, M. 2005. Procecure for Collecting Sediment for Pesticide Analysis. FSWA016.00

Segawa, R. 1995. SOP QAQC001.00 - Chemistry Laboratory Quality Control. Available on-line: http://www.cdpr.ca.gov/docs/empm/pubs/sops/qaqc001.pdf

Weston, D., R. Holmes, J You, M. Lydy. 2005. Aquatic toxicity due to residential use of pyrethroid insecticides. Environ. Sci. Tech. 39(24); 9778-9784.